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Early Spring Plants of Central North Dakota.

J. LUNELL.

It would be rather deceptive to determine the arrival of spring in North Dakota by the almanac. Sometimes it commences in March, but as a rule not until April. It does not set in promptly, as in the far north, where the Snowdrop, *Galanthus nivalis* springs up well-nigh from the bosom of a snow drift, and the *Narcissus, Crocus, Tulipa* and *Hyacinthus* follow just as soon as the ground is bare. On the contrary, Nature awakens very slowly here, and its progress is lingering, and it is timid and careful, afraid of being taken by surprise, the weather becomes slowly and imperceptibly warmer, and the first spring flower, *Pulsatilla hirsutissima,* dares at last to burst forth, after two weeks of hesitation. Invariably it receives its punishment, as the frost reaps millions of these flowers every spring. But another succession of flowers appears, the plumose styles and the leaves grow out, and late flowers are borne contemporaneously with the fully developed leaves in June and even July. The common name of this plant here is *Crocus,* probably because its sepals have the same size and shape of this offspring of the celebrated family *Iridaceae,* because both are children of the earliest spring, and because this, as we have no real *Crocus,* is the best "Crocus" available. Not even *Sanguinaria canadensis,* a plant growing in the extreme eastern part of the state, reaches this territory. The first day I found the *Pulsatilla* this year was on the 24th of March.

After this day comes a period of slow and tedious expectation, until by April 10th *Ranunculus ovalis* enters the stage, now just as tiny and tender as it is rank and exuberant four weeks later. *Acer fraxinifolium, Populus balsamifera candicans, deltoides* and *tremuloides, Ulmus fulva* and *americana* and *Celtis crassifolia* bring forth their flowers in advance of the leaves by this time, followed two weeks later by *Prunus*

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* June 15, 1910.—Pages 197 to 228.

americana, and still two or three weeks later by the aments of *Salix Bebbiana, candida, cordata, discolor* and *petiolaris,* the leaves of all of these appearing later than the flowers.

The herb coming next to *Ranunculus ovalis* is *Viola Lunellii* Greene, peeping out on April 18th, and two or three days later *Potentilla concinna* and *Lomatium orientale* never fail to present themselves, the latter being synchronous with *Cymopterus acaulis* and *Lomatium villosum* in the western part of the state. Now enter in quick succession *Viola Nuttallii* on the hill tops and *V. vallicola* further down the hill sides, and *V. Rydbergii* is the first blossom of the year penetrating the deep shade beneath the trees of the woods. Somewhat later than these *Viola anisopetala* Greene, and *V. pedatifida* are due. At this time *Mertensia foliosa* and further west *M. coronata* (or species very much resembling these natives of western Wyoming) enhance the beauty of the prairie.

An excursion on the 23d of April resulted in the following finds: *Phlox Hoodii, Lesquerella Lunellii* (maybe the most lovely looking plant of the genus, and at this time west of the divide replaced with *L. montana*), *Orophaca caespitosa* and *Carex filifolia,* all of these plants preferring the summits or the slopes of the hills, while *Antennaria campestris* loves the damp meadows, *Plantago eriopoda* chooses the whitish, alkaline low-land, and the holy grass, *Savastana odorata,* as the first-born of its family, gives a faint idea how magnificent the prairie will look when it becomes green at last.

Another excursion was made to Butte, on the 30th of April, which added the following plants to the spring flora: *Amelanchier alnifolia* in blossom and the just opened young leaves, *Sieversia ciliata, Comandra pallida, Androsace puberulenta* (in some other localities east and west of here replaced by *A. occidentalis*), *Nothocalais cuspidata, Thalictrum thyrsoideum* Greene, *Astragalus crassicarpus, Fragaria glauca* and *Aragallus dispar.* The last named plant is local for Butte, and transforms this place on the high hills into a veritable paradise during those ten days when it is blossoming. I have counted on its flowers a variation of sixteen different shades of gorgeous colors, from white, cream color, ochroleucous, light and dark blue, to light and dark rose purple, surpassing in their diversity all other plants of this state and probably of many other countries.

Of introduced plants these pariahs of the vegetable kingdom always unwelcome, undesirable hangers-on, nuisances in the path of civilization, weeds in the fields and around the railway stations, along the streets and in the yards of our cities, where they supplant the native herbs, as weeds often becoming a still higher grade of nuisances than they are in their native countries, of so many different kinds later in the season, we have only one representative in the early spring, the common Dandelion, *Taraxacum officinale.* This plant seems to have decided to conquer the earth, not even respecting the virgin prairie, where it often is smothering most other forms of plant life. Only a few years have passed since its first invasion, but we all understand that it came here to stay permanently.

This being an unusually early spring, with its vegetation three or four weeks in advance of what is produced in an average spring season, a continued chronological enumeration of plants would drift us into the flora of late spring or early summer. As this is quite a complete record of our early spring flora, it proves certainly beyond doubt that this flora is rather deficient in species numerically, and the flowering time for this flora is very variable for different years. However, such disturbances disappear gradually as the season advances, and the equilibrium is restored altogether at or maybe before the end of June. A plant like *Lilium umbellatum,* due on July 1st, knows and obeys this law, and will always arrive on time just when it is due.

Leeds, North Dakota.

Notes on the Seedlings of Bloodroot.

J. A. NIEUWLAND.

Having been fortunate during the season just past in securing typical stages of development of seedlings, I proceeded to examine these systematically with a view of obtaining results worthy of record. A more thorough anatomical investigation must, however, be reserved for future study.

The plants were specimens of the common Bloodroot of our middle western prairie region, which seem to be *Sanguinaria mesochora,* Greene,* or *Sanguinaria canadensis,* Linn., and of the authors in part. This species proposed by Dr. E. L. Greene appears to be somewhat different from the plants of the middle Atlantic States, and of New England and Northern Canada. The flowers of the mature plants, around which the seedlings were found, are comparatively small and almost invariably quadrate, of four large, broad outer petals and four smaller, shorter, and narrower inner ones. The flower has a

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* Greene, E. L. Pittonia, Vol. V, p. 306-308.